

WHAT IS CLAIMED IS:

1. A process for producing hydrogen by the intense thermal energy from thermochemical water splitting using iodine and sulfur dioxide, wherein an aqueous solution containing iodine as a main component and an aqueous solution containing sulfur dioxide as a main component are reacted across a membrane, thereby reducing the concentration of iodine in the second aqueous solution.
2. A process for producing hydrogen by the intense thermal energy from thermochemical water splitting using iodine and sulfur dioxide, wherein an aqueous solution containing iodine as a main component and an aqueous solution containing sulfur dioxide as a main component are reacted across a membrane, thereby concentrating the second aqueous solution until the concentration of hydroiodic acid in it is higher than the pseudo-azeotropic composition.
3. A process for producing hydrogen by the intense thermal energy from thermochemical water splitting using iodine and sulfur dioxide, wherein an aqueous solution containing iodine as a main component and an aqueous solution containing sulfur dioxide as a main component are reacted across a membrane, thereby concentrating the first aqueous solution until the concentration of sulfuric acid in it is higher than the value reported for the existing liquid-liquid separation method which is H_2SO_4 to $4\text{H}_2\text{O}$ in terms of molar ratio.
4. A process for producing hydrogen by the intense thermal energy from thermochemical water splitting using

iodine, sulfur dioxide and intense thermal energy, which employs electrode portions and a cation exchange membrane to have sulfur dioxide, iodine and water react with one another and obtain an aqueous solution of hydrogen iodide and an aqueous solution of sulfuric acid in separate form.